

## Glossary of Data Center Terms (courtesy of 42U.com)

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**2N** - A redundancy model that ensures that every component has a backup such that the data center has no single point of failure

## A

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**AC** - Alternating current

**ACAE** - Air conditioning airflow efficiency, the amount of heat removed per standard cubic foot of airflow per minute

**AHU** - Air handling unit

**Air Mixing** - The unintended mixing of cold and hot air

**Airside Economizer** - An economizer that directs exterior air into the data center when the air temperature is at or below the cooling set point

**Aisle** - The open space between rows of racks. Best-practice dictates racks should be arranged with consistent orientation of front and back to create 'cold' and 'hot' aisles.

**AMS** - Asset management system

**ASHRAE** - American Society of Heating, Refrigerating and Air-Conditioning Engineers is an international technical society organized to advance the arts and sciences of air management.

## B

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**BACnet** - A data communication protocol for building automation and control networks

**BAS** - Building automation system

**Blanking Panel** - A device mounted in unused U spaces in a rack that restricts bypass airflow, also called blanking or filler plates

**BMS** - Building management system, synonymous with BAS, AMS and other computer-based tools used to manage data center assets

**BTU** - British thermal unit, a standard measure of cooling equipment capacity

**Bypass Airflow** - Conditioned air that does not reach computer equipment, escaping through cable cut-outs, holes under cabinets, misplaced perforated tiles or holes in the computer room perimeter walls.

## C

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**C** - Degrees Celsius

**C/H** - Cooling/Heating

**Cabinet** - Device for holding IT equipment, also called a rack

**CAC** - Cold aisle containment system that directs cooled air from air conditioning equipment to the inlet side of racks in a highly efficient manner

**CADE** - Corporate average data center efficiency

**CapEx** - Capital expense, the cost of purchasing capital equipment

**Carbon Footprint** - A measurement of the volume in pounds of Carbon Dioxide generated by business operations.

**CFD** - Computational fluid dynamics, scientific calculations applied to airflow analysis

**CFM** - Cubic feet per minute, an airflow volume measurement

**Close-Coupled Cooling** - Cooling technology that is installed adjacent to server racks and enclosed to direct airflow directly to the rack without mixing with DC air

**Coefficient of Effectiveness (CoE)** - Uptime Institute metric based on the Nash-Sutcliffe model efficiency coefficient

**Cold Aisle** - An aisle where rack fronts face into the aisle. Chilled airflow is directed into this aisle so that it can then enter the fronts of the racks in a highly efficient manner.

**Cold Spot** - An area where ambient air temperature is below acceptable levels. Typically caused by cooling equipment capacity exceeding heat generation.

**CR** - Computer room

**CRAC** - Computer room air conditioner (pronounced crack) that uses a compressor to mechanically cool air

**CRAH** - Computer room air handler (pronounced craah) that uses chilled water to cool air

**Critical Load** - Computer equipment load delivered by PDU output

**CSI** - Cold supply infiltration index, quantifies the amount of hot air mixing with cold inlet air prior to entering the rack.

**Cutout** - An open area in a raised floor that allows airflow or cable feeds

**CW** - Chilled water

## D

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**DC** - Data center

**DCiE** - Data center infrastructure efficiency is an efficiency measure that is calculated by dividing the IT equipment power consumption by the power consumption of the entire data center. This measure is the inverse of [PUE](#).

**Dead Band** - An HVAC energy saving technique whereby sensitivity set points of equipment are set more broadly to improve coordination of the equipment and avoid offsetting behaviors, also dead band control strategy

**Delta T** - Delta temperature, the spread between the inlet and outlet air temperatures of air conditioning equipment, measured as the maximum achievable difference between inlet (return) and outlet (supply) temperatures. This is not the astronomical

measurement of Terrestrial Dynamical Time minus Universal Time.

**Dewpoint** - The temperature at which air reaches water vapor saturation, typically used when examining environmental conditions to ensure they support optimum hardware reliability

**D/H** - Dehumidifying/Humidifying

**Dry-Bulb Temperature** - The temperature of the air measured using a dry-bulb thermometer, typically taken in conjunction with a wet-bulb reading in order to determine relative humidity

## E

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**EFC** - Equivalent full cabinets, the number of full cabinets that would exist if all the equipment in the data center were concentrated in full cabinets

**ESD** - Electrostatic discharge, more commonly 'static discharge'

## F

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**F** - Degrees Fahrenheit

**Ft<sup>2</sup>** - Square feet or foot

## G

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**GPM** - Gallons per minute

## H

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**HAC** - Hot aisle containment system that directs heated air from the outlet side of racks to air conditioning equipment return ducts in a highly efficient manner

**Harmonic Distortion** - Multiples of power frequency superimposed on the power waveform that causes excess heating in wiring and fuses

**Heat Exchanger** - A device used to transfer heat energy, typically used for removing heat from a chilled liquid system

**HDG** - Hot dipped galvanized

**Hot Aisle** - An aisle where rack backs face into the aisle. Heated exhaust air from the equipment in the racks enters this aisle and is then directed to the CRAC return vents.

**HPDC** - High-performance data center, a data center with above average kW loading, typically greater than 10kW/rack

**Hot Spot** - An area, typically related to a rack or set of racks, where ambient air temperature is above acceptable levels. Typically caused by heat generation in excess of cooling equipment capacity.

**Hp** - Horsepower

**Hr** - Hour

**HVAC** - Heating, ventilation and air conditioning system, the set of components used to condition interior air including heating and cooling equipment as well as ducting and related airflow devices

## I

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**In-Row Cooling** - Cooling technology installed between server racks in a row that delivers cooled air to equipment more efficiently

**Inlet Air** - The air entering the referenced equipment. For air conditioning equipment this is the heated air returning to be cooled, also called return air. For racks and servers this is the cooled air entering the equipment.

**IP** - Internet protocol, a communications technology using the internet for communications.

**IR** - Infrared spectrum used by thermal imaging technologies

## J

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**JVM** - Java virtual machine, Java interpreter. Software that converts the Java intermediate language into executable machine language.

## K

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**kBTU** - Kilo British thermal unit, one thousand BTU, a unit of measurement for the cooling capacity of a CRAH

**kCFM** - Kilo-cubic feet per minute, 1000 CFM

**kV** - Kilovolt

**kW** - Kilowatts

**kWc** - Kilowatts of cooling, alternate unit of measurement for the cooling capacity of a CRAH

**kWh** - Kilowatt hours

**kVA** - Kilovolt amperes = voltage x current (amperage)

**KVM** - Keyboard, video, mouse; an interface technology that enables users to access multiple servers remotely from one or more KVM sites. More obscurely, can also mean K Virtual Machine: a version of the Java Virtual Machine for small devices with limited memory.

## L

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**Latent Cooling Capacity** - Cooling capacity related to wet bulb temperature and objects that produce condensation

**Line Noise** - Distortions superimposed on the power waveform that causes electromagnetic interference

**Liquid Cooling** - A general term used to refer to cooling technology that uses a liquid circulation system to evacuate heat as

opposed to a condenser, most commonly used in reference to specific types of in-row or close-coupled cooling technologies

**Load** - The kW consumption of equipment, typically installed in a rack. Also, the heat level a cooling system is required to remove from the data center environment

## M

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**MAH** - Makeup air handler, a larger air handler that conditions 100% outside air. Synonymous with MAU.

**Make-Up Air** - The conditioned air delivered by a MAU or MAH

**MAU** - Makeup air unit, a larger air handler that conditions 100% outside air. Synonymous with MAH.

**Maximum Temperature Rate of Change** - An ASHRAE standard established to ensure stable air temperatures. The standard is 9 degrees F per hour.

**MERV** - Minimum efficiency reporting value , ASHRAE 52.2, for air filtration measured in particulate size.

## N

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**N+1** - Need plus one, a redundancy concept where capacity is configured to include planned capacity plus one additional device to enable continued operations with the failure of one system in the configuration. This presumes immediate detection and remediation of the failed unit.

**NEBS** - Network equipment-building system design guidelines applied to telecommunications equipment

**No.** - Number

**Nominal Cooling Capacity** - The total cooling capacity of air conditioning equipment, includes both latent and sensible capacities. Due to humidity control in data centers, the latent capacity should be deducted from nominal capacity to determine useful capacity

## O

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**OpEx** - Operating expense, the ongoing expenses related to operating the data center

**Overcooling** - A situation where air is cooled below optimum levels. Typically used in reference to rack inlet temperatures.

## P

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**PDU** - Power distribution unit

**Pole** - A row of power receptacles with power supplied from a PDU

**Pole Position** - A power receptacle on a pole

**Pressure Differential** - The difference in pressure between two locations in the data center used to analyze air flow behaviors

**PH** - Phase, electrical phase 1-3

**Plenum** - A receiving chamber for air used to direct air flow

**PU** - Packaged unit, an air handler designed for outdoor use.

**PUE** - Power usage effectiveness, a measure of data center energy efficiency calculated by dividing the total data center energy consumption by the energy consumption of the IT computing equipment. This measure is the inverse of [DCiE](#).

## R

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**Rack** - Device for holding IT equipment, also called a cabinet

**RAH** - Recirculation air handler, a device that circulates air but does not cool the air

**Raised Floor** - Metal flooring on stanchions that creates a plenum for airflow and cabling, synonymous with RMF

**Recirculation** - Chilled airflow returning to cooling units without passing through IT equipment, also referred to as short cycling

**Return Air** - The heated air returning to air conditioning equipment

**RFI** - Radio frequency interference

**Rh** - Relative humidity

**RMF** - Raised metal floor, an alternate term for the more commonly used term 'raised floor'

**ROI** - Return on investment, a measure of the amount of time required to recover an investment

**RPM** - Revolutions per minute, used to measure fan speeds

**RPP** - Remote power panel

**RTU** - Rooftop unit, an air handler designed for outdoor use mounted on a rooftop. A typical application of a PU.

## S

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**S+S** - System plus system

**SCFM** - Standard cubic feet per minute, the volumetric flow rate of a gas corrected to standardized conditions of temperature, pressure and relative humidity

**Sensible Cooling Capacity** - Cooling capacity related to dry bulb temperature and objects that do not produce condensation

**Sensitivity** - An equipment setting that bounds the set point range and triggers a change in device function when exceeded. Most commonly referring to **CRAC/CRAH** temperature and humidity set points.

**Set Point** - Typically used in reference to air conditioning equipment thermostat temperature and humidity settings

**Short Cycling** - Chilled airflow returning to cooling units without passing through IT equipment, also referred to as recirculation

**STS** - Static transfer switch

**Sub-Floor** - The open area underneath a raised computer floor, also called a sub-floor plenum

**Supply Air** - The cooled airflow emitted from air conditioning equipment

## T

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**TCE** - Triton Coefficient of Effectiveness<sup>SM</sup>, synonymous with UCE

**Thermistor** - A type of resistor with resistance varying according to its temperature

## U

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**U** - Rack mount unit, the standardized height of one unit is 1.75"

**UCE** - Upsite Coefficient of Effectiveness<sup>SM</sup>, synonymous with TCE

**UPS** - Uninterruptible power supply, device used to supply short-term power to computing equipment for brief outages or until an alternate power source, such as a generator, can begin supplying power.

## V

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**VFD** - Variable frequency drive

## W

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**W** - Watt(s)

**Waterside Economizer** - An economizer that redirects water flow to an external heat exchanger when the exterior ambient air temperature is at or below a temperature required to chill water to a given set point, simultaneously shutting down the mechanical chiller equipment.

**Wet-Bulb Temperature** - The temperature of the air measured using a wet-bulb thermometer, typically taken in conjunction with a dry-bulb reading in order to determine relative humidity

**Wg** - Inches of water column, an approximate unit of measurement for static air pressure

**Work Cell** - The area of a rack and the related area immediately in front of and behind the rack. Standard racks are 2 feet wide and 4 feet deep. Standard aisles are 4 feet wide, so half of that space is workspace for a given rack. This results in a standard work cell of 16 square feet. Actual work cell size varies with data center design.

**WPSF** - Watts per square foot